

1. Specify: agricultural project or X individual application or
 X urban project joint application

2. Proposal title -- concise but descriptive: Water Conservation Incentives for Golf Courses

3. Principal applicant -- organization or affiliation: Placer County Water Agency

4. Contact -- name, title: Mike Nichol

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6. Telephone: (530) 823-4864

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8. E-mail: mnichol@pcwa.net

9. Funds requested -- dollar amount: \$80,000

10. Applicant cost share funds pledged -- dollar amount: \$80,000

11. Duration (month/year to month/year): September 2001 to November 2002

12. State Assembly and Senate districts and Congressional district(s) where the project is to be conducted: State Assembly District – 4; State Senate District – 1; Congressional District – 4.

13. Location and geographic boundaries of the project: Placer County, California

14. Name and signature of official representing applicant. By signing below, the applicant declares the following:
___ the truthfulness of all representations in the proposal;
___ the individual signing the form is authorized to submit the application on behalf of the applicant;
___ the applicant will comply with contract terms and conditions identified in Section 11 of this PSP.

(date)

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SECTION B

SCOPE OF WORK

This section consists of the scope of work. The relevance and importance of the project are described, and its merit, feasibility, monitoring, and assessment are addressed.

B.1 Relevance and Importance

This section presents a summary of the project, a statement of water issues, and the scope and objectives of the project.

B.1.1 Abstract. The project consists of the development and implementation of methods that will provide incentives for golf courses to use water more efficiently in Zone 1 of the Placer County Water Agency (PCWA). This project will target eight golf courses, which use approximately 10% of the total water use in Zone 1. The eight golf courses total 559 acres of irrigated land area and currently use 8,340 ac-ft/year for irrigation. This project will implement water conservation incentives that will save up to a total potential of 3,026 ac-ft/year. The objective of this project is to implement incentives for golf courses in Zone 1 so that water is used more efficiently within PCWA.

B.1.2 Water Issues, Need, and Consistency with Other Plans. The efficient use of California's limited water supplies is a critical local, regional, and statewide water issue. The purpose of this project is to significantly increase water use efficiency by large landscape golf course customers.

PCWA utilizes surface water from the Yuba River, Bear River and the American River as its water supply. This project will provide benefit to the Bay-Delta by ensuring that water diverted upstream of the Bay-Delta is used efficiently. The project is needed to achieve greater water use efficiency and maximize the usage of water diverted from the Yuba, Bear, and American Rivers. The golf course water conservation methods developed and implemented under this project offer potential water savings of approximately 3,026 acre-feet per year.

This project involves the implementation of urban water conservation best management practice (BMP) number 5, *Large Landscape Conservation Programs and Incentives*, and BMP number 11, *Conservation Pricing* as defined by the California Urban Water Conservation Council (CUWCC). BMP 5 states that the agency shall provide non-residential customers with support and incentives to improve their landscape water conservation efficiency. BMP 11 states that implementation methods shall be at least as effective as eliminating non-conserving pricing and adopting conserving pricing. It is widely recognized that incentive pricing is an effective means of encouraging water use efficiency. The unpredictable water supply and ever increasing demand on California's complex water resources have resulted in a coordinated effort by the California Department of Water Resources (DWR), water utilities, environmental organizations, and other interested groups to develop a list of urban BMPs for conserving water. This consensus-building effort resulted in the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), which formalizes an agreement to implement these BMPs and makes a cooperative effort to reduce the consumption of California's water resources. Becoming a signatory is entirely voluntary. PCWA is not a signatory of the MOU.

This project is compatible with PCWA's 2000 Urban Water Management Plan (UWMP) (Brown and Caldwell, Urban Water Management Plan, 2000) and PCWA's ongoing efforts to achieve greater water use efficiency. As stated in the 2000 UWMP, PCWA's Board of Directors recognizes the importance of water management and conservation programs. PCWA's adopted rules and regulations include the general policy of the water system that states in part that the PCWA will operate and maintain the water system in an efficient and economical manner and distribute and supply water as fairly and equitably as possible.

In August 1999, PCWA requested assistance from DWR's Water Use Efficiency Office to assess water efficiency opportunities in Zone 1. Regarding large landscape water conservation, the February 2000 DWR study (Appendix III) recommended that PCWA prepare an analysis of bimonthly seasonal use for each customer category to help target customers for landscape irrigation management programs and develop programs to address irrigation water use. The project proposed for funding with this application is an integral step in implementing these recommendations.

PCWA is a member of the Sacramento Water Forum. In the year 2000, the Water Forum finalized the *Water Forum Agreement* (Agreement) which contains seven major elements to meet its objectives. Water conservation is the fifth major element in the Agreement. The water conservation portion of the Agreement describes each water purveyor's commitments to implement BMPs. These BMPs were derived from the original MOU developed by the CUWCC, and then customized for the Water Forum conservation agreements prepared for the individual purveyors. As a signatory of the Water Forum Agreement, PCWA has agreed to follow their individual Water Forum conservation plan, which includes implementation of landscape conservation and conservation pricing.

B.1.3 Project Nature, Scope, and Objectives. The project consists of the development and implementation of methods that will provide water conservation incentives for eight large landscape golf courses within PCWA's Zone 1.

The objectives of the project are to realize greater water use efficiency by developing and implementing new water use methodology that will provide incentives for large landscape golf course water conservation and reduce excess water spills in delivery canals.

B.2 Technical/Scientific Merit, Feasibility, Monitoring, and Assessment

This section describes the merit, feasibility, and the monitoring and assessment of the project.

B.2.1 Methods, Procedures, and Facilities. A technically adequate approach to achieve the project objectives has been described. PCWA will use standard engineering, construction, and rate structure methods to implement this project.

The scope of the project consists of several tasks.

1. Develop water audit implementation plan.
2. Conduct the large landscape water audits, establish water budgets.
3. Develop incentives for golf course customers to conserve water.
4. Develop plan for communication with golf courses – communicate when less water will be taken from canal.

5. Evaluate rate structure.
6. Modify rules/regulations; Receive Board of Directors approval.
7. Implement new methodology.
8. Measure results/issue report.

PCWA will perform on-site large landscape water use audits and surveys. They will develop water use budgets and train the golf course customers in landscape maintenance and irrigation system maintenance. Survey elements will include measurement of landscape area; measurement of total irrigable area; irrigation system check, and distribution uniformity analysis. Irrigation schedules will be reviewed or developed, as appropriate. PCWA will give the golf course customer a survey report and information packet.

Conservation pricing provides incentives to customers to reduce average or peak use, or both. Such pricing includes: rates designed to recover the cost of providing the service; and billing for water and sewer service based on metered water use. Conservation pricing is also characterized by one or more of the following components: rates in which the unit rate is constant regardless of the quantity used (uniform rates) or increases as the quantity used increases (increasing block rates); seasonal rates or excess-use surcharges to reduce peak demands during summer months; rates based upon the long-run marginal cost or the cost of adding the next unit of capacity to the system.

B.2.2 Schedule. A bar chart schedule is presented in Figure B-1. Table B-1 presents a quarterly expenditure projection.

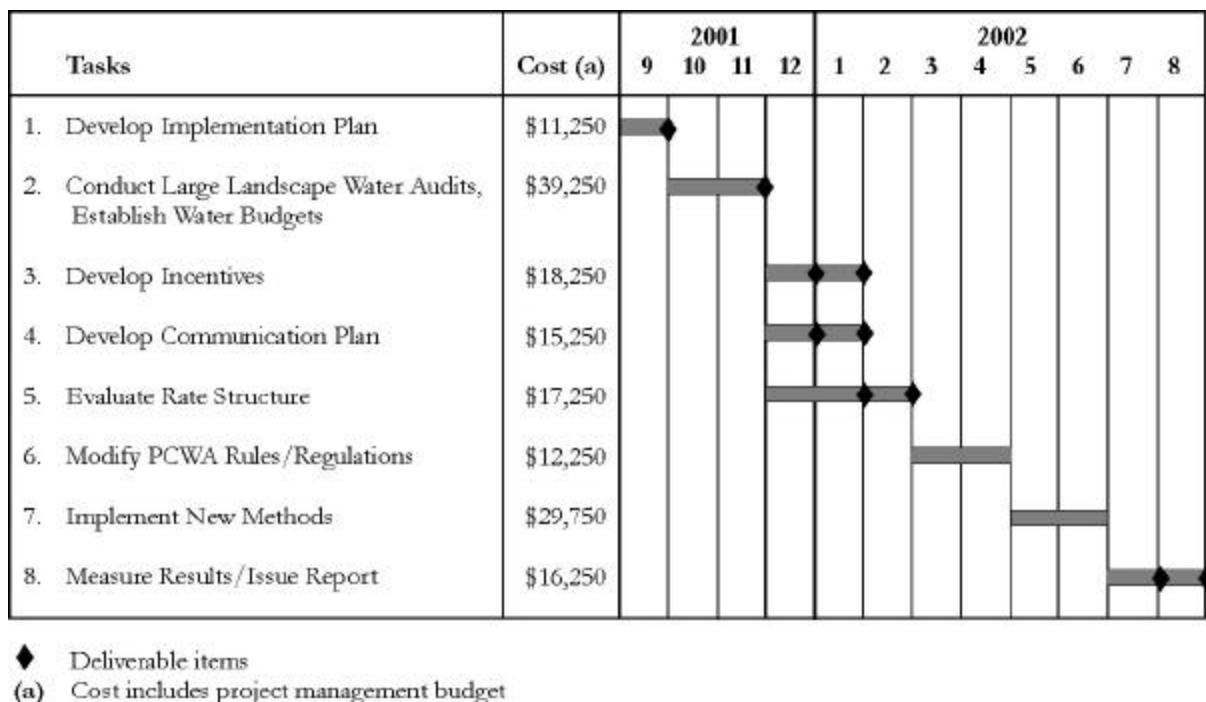


Figure B-1. Project Timeline

Table B-1. Quarterly Expenditure Projection

Quarter	Months	Expenditure, \$
1	September-November	50,500
2	December-February	50,750
3	March-May	27,625
4	June-August	31,125

B.2.3 Monitoring and Assessment. PCWA will monitor and assess the before and after water use of the eight golf courses. A report will be issued within two years of the completion of the project documenting the results. The information will be made available to the public through various outreach methods.

SECTION C

OUTREACH, COMMUNITY INVOLVEMENT, AND INFORMATION TRANSFER

This section describes outreach efforts that will be made by Placer County Water Agency (PCWA) during the project; training, employment, and capacity building potential the project provides; and the plan for disseminating information regarding the phases of the project.

C.1 Outreach Efforts

Outreach efforts will focus primarily on the large landscape golf course customers, since the project scope of work focuses primarily on these customers. Outreach to people in disadvantaged communities is not appropriate to this project, nor will there be a need to develop partnerships to complete the project. There are no tribal entities in the area that will be impacted by the project.

C.2 Training, Employment, and Capacity Building Potential

A key benefit of the project is the training of surveyed customers in water use efficiency. Surveyors will be proficient in communicating the benefits of water use efficiency with golf course customers.

C.3 Information Dissemination Plan

Information on the results of this project will be disseminated through the PCWA's public outreach program. PCWA operates an extensive public information program and associated schools program, which provide materials, speakers, and outreach activities to the general public.

Outreach activities will include publications and Web site development, public meetings, PCWA participation at community events, multimedia campaigns, interagency partnerships, corporate environmental fairs, professional trade shows, water conservation workshops and seminars and a speakers bureau.

Summaries of the results and benefits of this project will be developed by PCWA staff and made available to PCWA customers. Inserts will be included in billing mailer inserts, newsletters, and agency Web sites.

C.4 Letters of Notification

No letters of notification were necessary due to the nature of this project.

SECTION D

QUALIFICATIONS OF THE APPLICANTS, COOPERATORS, AND ESTABLISHMENT OF PARTNERSHIPS

A description of Placer County Water Agency (PCWA) and the qualifications of the project manager are discussed in this section.

D.1 PCWA and the Project Manager

PCWA is a public agency established in 1957 by a special Act of the California Legislature (Placer County Water Agency Act, Statutes of 1957, Chapter 1234). Its boundaries are the same as Placer County. Its governing body, a five-member Board of Directors, is elected by the voters. PCWA provides water to approximately 150,000 people in Placer County located in five separate retail zones. PCWA directly serves about 35,000 agricultural, municipal, and industrial connections in the cities of Auburn, Colfax, Loomis, Newcastle, Rocklin and many other small communities. PCWA also makes wholesale deliveries of water to San Juan Water District, the City of Roseville, and the City of Lincoln.

Placer County is located midway between the snow-fed Yuba/Bear and American Rivers, which cascade westward toward the Sacramento Valley. The County is located immediately northeast of Sacramento County, and about 120 miles northeast of the San Francisco metropolitan area.

The current main source of water for PCWA is from the Yuba and Bear Rivers. The supply comes from Lake Spaulding and is purchased from Pacific Gas and Electric Company. Other sources of water include the American River, the Central Valley Project, and groundwater wells. Treated and untreated water use for the year 2000 was 114,525 acre-feet (Brown and Caldwell, Urban Water Management Plan, 2000).

PCWA officials understand the complexities, interrelationships and importance to sustain reliable and affordable water and energy for Placer County. Current PCWA activities include involvement in issues affecting the Lake Tahoe and Truckee River system; the American River system; the Yuba/Bear Rivers system; the Central Valley Project and Bay/Delta system; watershed management collaborations; groundwater management; advocate for PCWA water entitlements; participant in electric deregulation and hydroelectric divestiture. PCWA officials are in close communication with local, regional, State and Federal officials plus private sector representatives and members of the

public and community on water and energy issues affecting Placer County's present and future needs.

The project manager responsible for the golf course water use efficiency program will be Mike Nichol, the Senior Utility Resource Specialist. Mr. Nichol's resume is included in Appendix I. Mr. Nichol has 9.5 years of experience in operating the canal system that supplies the golf courses. The golf course water use efficiency program will support the water conservation efforts in the PCWA service area.

D.2 External Cooperators

No external cooperators will be utilized for PCWA's large landscape water use efficiency program.

D.3 Partnerships Developed to Implement Project

No external partnerships will be developed for PCWA's large landscape water use efficiency program.

SECTION E

COSTS AND BENEFITS

This section describes both the quantifiable and non-quantifiable costs and benefits associated with the project. Included is a detailed budget summary and breakdown and justification. An assessment of costs and benefits of the proposed project is also provided.

E.1 Budget Summary and Breakdown

Table 1 in Appendix II presents a detailed estimated budget that includes salaries and wages, fringe benefits, supplies, equipment, services and consultants, travel and other direct costs. The table is a breakdown of the estimated costs between PCWA-provided services and the services of the consultant that will be conducting the project.

The total cost of the project is \$160,000. PCWA is requesting \$80,000 from CALFED funding grants. The remaining fifty percent will be provided by PCWA through in-kind services and capital outlay.

E.2 Budget Justification

The budget estimate was prepared by PCWA and Brown and Caldwell, a professional water engineering firm with extensive experience in managing and conducting water conservation projects like this golf course water conservation project. Brown and Caldwell is an approved consultant included in the California Urban Water Conservation Council's list of qualified consultants for the Year 2001.

E.3 Benefit Summary and Breakdown

This section lists the expected project outcomes and benefits of the proposed project.

- a) **Quantifiable Project Outcomes and Benefits.** The goal of this project is to reduce golf course water use by 3,026 ac-feet per year. This is a benefit to PCWA in that it allows them to “stretch” their surface water entitlements from the Yuba, Bear, and American Rivers. It is also a benefit to CALFED in that it will allow upstream water in PCWA to be used efficiently.
- b) **Non-Quantifiable Project Outcomes and Benefits.** There are many project benefits that can not be effectively quantified at this point in time. These are:
 - 1) Improved Bay-Delta ecosystem. By using water more efficiently within their service area, this project will allow PCWA to delay the date of need to use their full water right entitlements from the Yuba, Bear, and American Rivers. Therefore, in the interim, more water will be available to benefit the Bay-Delta ecosystem.
 - 2) Energy savings as a result of less water pumped to the two golf courses that are not gravity fed by PCWA’s canal system.
 - 3) Economic savings to customers as a result of efficient use of water.
 - 4) The ability of the District to establish more equitable customer utility rates.

E.4 Assessment of Costs and Benefits

This section includes an assessment that summarizes the costs and benefits of the proposed project. The major analysis assumptions are listed and explained. This section also shows the present value of the quantified costs and benefits for the applicant and CALFED and summarizes non-quantified costs and benefits to the applicant, CALFED, and the golf course customers.

The golf course customers and the irrigated acreage are listed in Table E-1. Table E-2 displays the California Irrigation Management Information System (CIMIS) monthly Evapo Transpiration (ET_o) based on the Reference ET_o Zone 14. This table also displays the theoretical optimum (TO) water use per month, which is the product of the CIMIS monthly ET_o factor and the total irrigated area in Table E-1. A column for the practical limit (PL) water use per month is calculated by assuming that half of the PL water use is dedicated for site losses which include evaporation, infiltration, and water amenities (golf course hazards, site flow through, landscape features) throughout the golf course and the other half is dedicated to irrigation using the TO as the monthly irrigation use. A column for current use displays the current golf course water use per month using the following estimations:

- Whitney Oaks, Twelve Bridges, Winchester, Sunset Whitney, and The Ridge use 137 ac-ft/month (4.5 ac-ft/day) May through October and 68 ac-ft/month (2.25 ac-ft/day) November through April.
- Black Oak and Indian Hills use 91 ac-ft/month (3 ac-ft/day) May through October and 46 ac-ft/month (1.5 ac-ft/day) November through April.
- Raspberry Hill uses 61 ac-ft/month (2 ac-ft/day) May through October and 30 ac-ft/month (1 ac-ft/day) November through April.

The last column, water savings, is the difference between the practical limit and the current use.

Table E-1. Golf Courses

Name	Irrigated area, acre-feet
1. Black Oak	44
2. Whitney Oaks	93
3. Twelve Bridges	87
4. Raspberry Hills	26
5. Winchester	88
6. Indian Hills	42
7. Sunset Whitney	90
8. The Ridge	89
Total	559

Table E-2. Large Golf Courses

Month	CIMIS factor ^a , in/month	Theoretical optimum water use, ac-ft/month	Practical limit water use ^b , ac-ft/month	Current water use, ac-ft/month	Potential water savings, ac-ft/month
January	1.6	72	144	462	318
February	2.2	104	209	462	253
March	3.7	173	347	462	115
April	5.1	238	475	462	-13
May	6.8	318	635	928	293
June	7.8	363	727	928	201
July	8.7	404	809	928	119
August	7.8	361	722	928	206
September	5.7	266	531	928	397
October	4.0	188	375	928	553
November	2.1	98	196	462	266
December	1.6	72	144	462	318
Total annual	57.0 in/year	2,657 ac-ft/year	5,314 ac-ft/year	8,340 ac-ft/year	3,026 ac-ft/year

^aCalifornia Irrigation Management Information System (CIMIS) monthly factors based on Reference Evapo Transpiration Zone 14.

^bPractical limit water use=Theoretical Optimum water use + Evaporation Loss + Onsite Infiltration Loss + Water Amenities

All quantified benefits and costs in Table E-3 are expressed in year 2000 dollars using a six percent discount rate. Major assumptions for the analysis of the quantifiable cost and benefits are displayed in the tables above. In addition, the value of conserved water in PCWA is \$40/ac-ft and the life of the benefits associated with this project is assumed to be 5 years.

A summary of the quantified costs and benefits are compiled in Table E-3. A summary of the non-quantified costs and benefits are compiled in Table E-4. Appendix II contains the benefit and cost assessment spreadsheet.

Table E-3. Summary of Quantified Year 2000 Discounted Costs and Benefits

Agency	Costs, dollars	Benefits, dollars
District	75,472	509,826
CALFED	75,472	None

Table E-4. Summary of the Non-quantified Costs and Benefits

Agency	Non-quantified costs	Non-quantified benefits
PCWA	<ul style="list-style-type: none"> • Possibly less revenue due to declined customer use. 	<ul style="list-style-type: none"> • More efficient water use. • Energy savings.
CALFED	None	<ul style="list-style-type: none"> • More efficient water use. • Improved Bay-Delta ecosystem in interim years.
Golf course customers	<ul style="list-style-type: none"> • Possible irrigation improvements. • More effort to communicate with PCWA. 	<ul style="list-style-type: none"> • Possible economic incentives. • Energy savings.

APPENDIX I

RESUMES

Work Experience

Placer County Water Agency - July 1989-Present

Increasing responsibility from Resident Engineer overseeing construction of a 15 mgd water treatment plant expansion and a 10 million gallon water storage tank to Director of Field Services responsible for canal operations and maintenance, treated water pipeline maintenance, warehouse and fleet maintenance. Over 9 years associated with Placer County Water Agency's raw water distribution system.

Guy F. Atkinson - April 1984-July 1989

Increased responsibility from Field Engineer to Project Engineer on dam sites in Utah and California, and a project in Virginia building islands.

Nevada Bureau of Mines and Geology - 1980-1982

Research Assistant performing Earthquake Hazard Mapping around Reno, Nevada.

Education

Master of Science: Geological Engineering from McKay School of Mines, University of Nevada-Reno, 1983.

Master of Business Administration: University of Nevada-Reno, 1983.

Bachelor of Science: Civil Engineering, University of the Pacific, 1980.

Certifications

Registered Professional Engineer.

State of California Dept of Health Services Grade 3 Water Treatment Plant Operator.

American Water Works Association Grade 3 Water Distribution Operator.

Miscellaneous

Member of AWWA Water Distribution Operator Certification Committee

APPENDIX II

BUDGET

Appendix II
Table 1. Golf Course Water Conservation Cost Estimate

Task	Number	PCWA				Contractor		Total Project
		Hours	Hourly Rate	Labor Dollars	ODCs	Labor Dollars	Material	Dollars
Task 1. Develop implementation plan		80	100	8,000	1,000			9,000
Task 2. Conduct water audits/establish budgets	8	32	100	3,200	500	32,000	1,300	37,000
Task 3. Develop incentives		140	100	14,000	2,000			16,000
Task 4. Develop communication plan		125	100	12,500	500			13,000
Task 5. Evaluate rate structure		140	100	14,000	1,000			15,000
Task 6. Modify rules/regulation		100	100	10,000	500			10,500
Task 7. Implement new methodology		265	100	26,500	1,000			27,500
Task 8. Measure results/issue report		130	100	13,000	1,000			14,000
Sub-total		1,012		101,200	7,500	32,000	1,300	142,000
Project Management				18,000				
Total				119,200	7,500	32,000	1,300	160,000

Placer County Water Agency	50%	80,000
CALFED	50%	80,000

Appendix II

Table 2. Benefits and Costs Assessment

Total irrigated acres	559			
Discount Rate	6.00%			
Present Value Year	2000			
Cost of conserved water \$/ac-ft=	40			
Name	Irrigated area ac-ft	May-Oct ac-ft/month	Nov-Apr ac-ft/month	Annual Water use ac-ft/yr
1. Black Oak	44	91	46	822
2. Whitney Oaks	93	137	68	1230
3. Twelve Bridges	87	137	68	1230
4. Raspberry Hills	26	61	30	546
5. Winchester	88	137	68	1230
6. Indian Hills	42	91	46	822
7. Sunset Whitney	90	137	68	1230
8. The Ridge	89	137	68	1230
Total	559	928	462	8340

Month	CIMIS factor, in/month	Theoretical optimum water use, ac-ft/month	Practical limit water use, ac-ft/month	Current water use, ac-ft/month	Potential water savings, ac-ft/month
January	1.6	72	144	462	318
February	2.2	104	209	462	253
March	3.7	173	347	462	115
April	5.1	238	475	462	-13
May	6.8	318	635	928	293
June	7.8	363	727	928	201
July	8.7	404	809	928	119
August	7.8	361	722	928	206
September	5.7	266	531	928	397
October	4.0	188	375	928	553
November	2.1	98	196	462	266
December	1.6	72	144	462	318
Total annual	57.0	2,657	5,314	8,340	3,026

Calendar Year	Annual Savings ac- ft/yr	Benefits		Costs	
		Avoided variable costs, \$	Discounted benefits, \$	Project costs, \$	Discounted costs, \$
2001	3,026	121,031	114,180	160,000	150,943
2002	3,026	121,031	107,717		
2003	3,026	121,031	101,620		
2004	3,026	121,031	95,868		
2005	3,026	121,031	90,441		
Total	15,129	605,155	509,826	160,000	150,943

APPENDIX III

DEPARTMENT OF WATER RESOURCES WATER CONSERVATION STUDY, 2000